

7 15

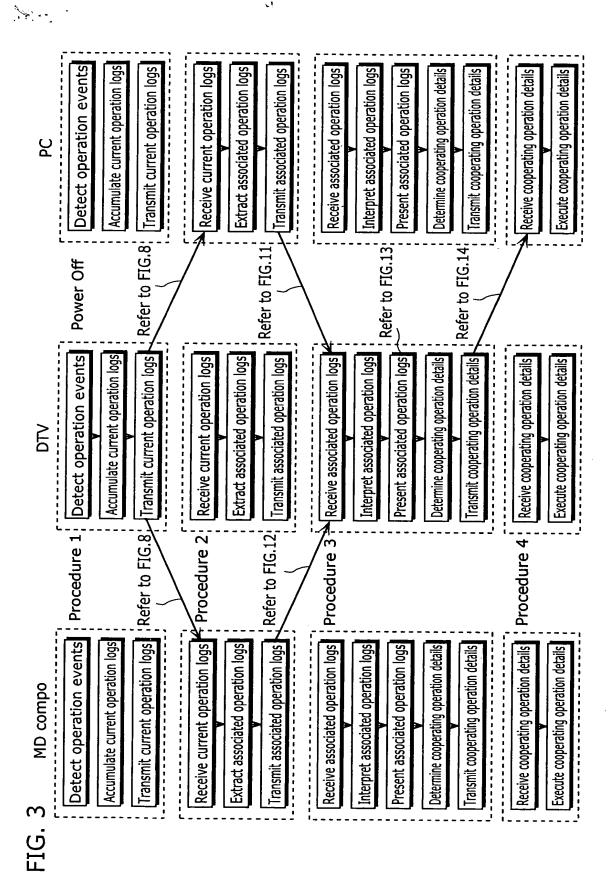
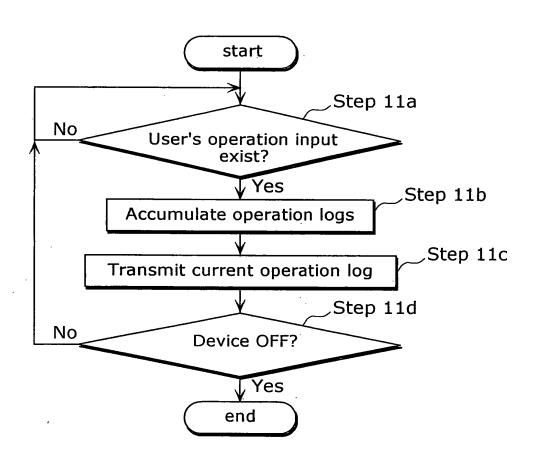
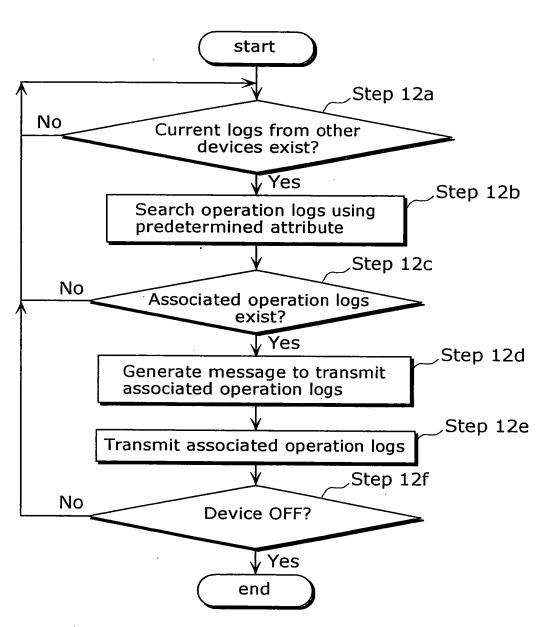


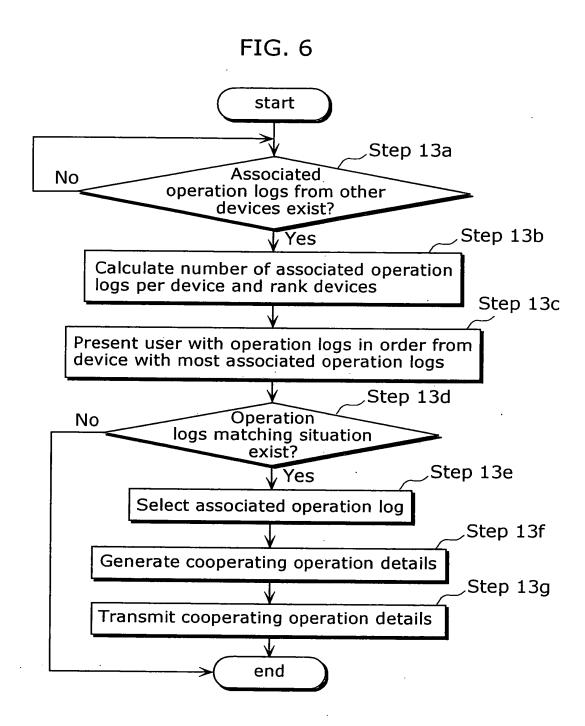
FIG. 4



17.5

FIG. 5





2002/09/25, Wed, 21:00:00 yyyy/mm/dd/hh/mm/ss:Example) Date and time identifier<Time>

Play, Record, Reserve, Send, Receive, Save, Delete, Update, Copy, Move, Boot, Activate PowerOn, PowerOff, VolUp, VolDown ·Operation identifier<Command>

·User identifier<UserID>
xxx@yyy. co. jp

·Device identifier<DeviceID>

Device level identifier < DevicePerformanceLevel >

Controller identifier < Controller ID>

User cooperation identifier<PersonTo>, <PersonFrom>

Device cooperation identifier<DeviceTo>, <DeviceFrom>

Location identifier<Location>

Cost identifier<Cost>

Application identifier<ApplicationID>

Media identifier<MediaID>

Content identifier ContentID>

Service identifier<ServiceID> Object identifier<ObjectID>

```
<ContentID> program://x-ch. osaka. tv/20020925210000-20020925215300 </ContentID>
                                                              <DevicePerformanceLevel> Device-L4 </DevicePerformanceLevel>
                                                                                                                                                                                                                                                                                                                                     <Time> 2002/09/25/Wed/21:53:10 </Time>
                                                                                                                               <Time> 2002/09/25/Wed/20:57:00 </Time>
                               <DeviceID> Dtv. xxx-net </DeviceID>
                                                                                                                                                                                                                                                                                                                                                                      <Command> PowerOff </Command>
                                                                                                                                                                   <Duration> 00:56:10 </Duration>
                                                                                                                                                                                                    <Command> play </Command>
                                                                                                                                                                                                                                                                                                                                                                                                                                        </OperationLog>
<OperationLog>
                                                                                                                                                                                                                                                                                                                                                                                                         </Item>
                                                                                                                                                                                                                                                                    </Item>
                                                                                                  <Item>
                                                                                                                                                                                                                                                                                                      <Item>
```

```
<OperationLog>
<DeviceID> PC. xxx-net </DeviceID>
<DevicePerformanceLevel> Device-L5 </DevicePerformanceLevel>
                                                                                                                <Time> 2002/09/18/Wed/21:54:13 </Time>
                                                                                                                                                                                                                                                                                                                                                                                                                                                         <ApplicationID> Mailer-xxx </ApplicationID>
                                                                                                                                                                                            <Item>
<Time> 2002/09/19/Thu/21:53:12 </Time>
                                                                                                                                                                                                                                                                                                                                                                                                         <Time> 2002/09/24/Tue/21:55:20 </Time>
<Command> Activate </Command>
                                                                                                                                                                                                                                                                                                                 </Time>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              <Time> 2002/09/24/Tue/22:02:10 </Time>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               <PersonTo> xxx@yyy. co. jp </PersonTo>
                                                                                                                                                                                                                                                                                                             <Time> 2002/09/24/Tue/21:53:04
<Command> Boot </Command>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       <Command> Send </Command>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    </OperationLog>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      </Item>
                                                                                                                                                                                                                                                                                                                                                               </Item>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   </Item>
                                                                                                                                                                                                                                                                                        <Item>
                                                                                                                                                                                                                                                                                                                                                                                      <Item>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <Item>
                                                                                              <Item>
```

```
<ContentID> program://FM. osaka/20020925220000-20020925225700 </ContentID>
                                              <DevicePerformanceLevel> Device-L2 </DevicePerformanceLevel>
                                                                                                                                                                                                                                  <Time> 2002/09/22/Sun/21:57:52 </Time>
                                                                                                                                                                                                                                                                                                                                          <Time> 2002/09/22/Sun/21:57:55 </Time>
                                                                                                                             2002/09/21/Sat/21:53:11 </Time>
                       <DeviceID> MD. xxx-net </DeviceID>
                                                                                                                                                                                                                                                               <Command> PowerOn </Command>
                                                                                                                                                                                                                                                                                                                                                                       <Command> Tuner </Command>
                                                                                                                                                                                                                                                                                                                                                                                           <MediaID> FM </MediaID>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        </OperationLog>
<OperationLog>
                                                                                                                              <Time>
                                                                                                                                                                                                                                                                                          </Item>
                                                                                                                                                                                                                                                                                                                                                                                                                                                     </Item>
                                                                                                                                                                                                                                                                                                                    <Item>
                                                                                                                                                                                                               <Item>
                                                                                                       <Item>
```

```
<RelatedLog>
<DeviceTo> DTV. xxx-net </DeviceTo>
<OperationLog>
<DeviceID> PC. xxx-net /DeviceID>
<DevicePerformanceLevel> Device-L5 /DevicePerformanceLevel>
<Item>
<Time> 2002/09/18/Wed/21:54:13 </Time>
<Item>
<Time> 2002/09/19/Thu/21:53:12 </Time>
<Item>
<Time> 2002/09/24/Tue/21:53:04 </Time>
<Command> Boot </Command>
</Item>
<Item>
<Time> 2002/09/24/Tue/21:55:20 </Time>
<Command> Activate </Command>
<ApplicationID> Mailer-xxx </ApplicationID>
</Item>
<Item>
<Time> 2002/09/24/Tue/22:02:10 </Time>
<Command> Send </Command>
<PersonTo> xxx@yyy. co. jp </PersonTo>
</Item>
</OperationLog>
</RelatedLog>
```

```
<ContentID> program://FM. osaka/20020925220000-20020925225700 </ContentID>
                                                                                                        <DeviceID> MD. xxx-net </DeviceID>
<DevicePerformanceLevel> Device-L2 </DevicePerformanceLevel>
                                                                                                                                                                                                                                                                                                                                                                                                                                           <Time> 2002/09/22/Sun/21:57:55 </Time>
                                                                                                                                                                                                                                                                                                                               <Time> 2002/09/22/Sun/21:57:52 </Time>
                                                                                                                                                                                                                     <Time> 2002/09/21/Sat/21:53:11 </Time>
                        <DeviceTo> DTV. xxx-net </DeviceTo>
                                                                                                                                                                                                                                                                                                                                                           <Command> PowerOn </Command>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                         <Command> Tuner </Command>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                <MediaID> FM </MediaID>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  </OperationLog>
                                                                              <OperationLog>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        </RelatedLog>
<RelatedLog>
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          </Item>
                                                                                                                                                                                                                                                                                                                                                                                         </Item>
                                                                                                                                                                                              <Item>
                                                                                                                                                                                                                                                                                                         <Item>
                                                                                                                                                                                                                                                                                                                                                                                                                    <Item>
```

> FIG. 13)				•								FM. osaka/ 20020922220000-2002092225700		FM. osaka/ 20020921220000-20020921225700
<command/> <applicationid></applicationid>		Mailer-xxx	<mediaid></mediaid>		FM	ī	ΕM								
<command/>	Boot	Activate		PowerOn	Tuner	PowerOn	Tuner								
<time></time>	2002/09/24/ Tue/21:53:04	2002/09/24/ Tue/21:55:04	2002/09/23/ Mon/21:55:22	2002/09/23/ Mon/21:57:04	2002/09/20/ Fri/21:53:50	2002/09/20/ Fri/21:55:50	2002/09/19/ Thu/21:53:12	2002/09/19/ Thu/21:55:12	2002/09/18/ Wed/21:54:13	2002/09/18/ Wed/21:56:13		2002/09/22/ Sun/21:57:52	2002/09/22/ Sun/21:57:55	2002/09/21/ Sat/21:53:11	2002/09/21/ Sat/21:53:15
<deviceid></deviceid>	PC. xxx-net		MD. xxx-net	MD. xxx-net	MD. xxx-net	MD. xxx-net									

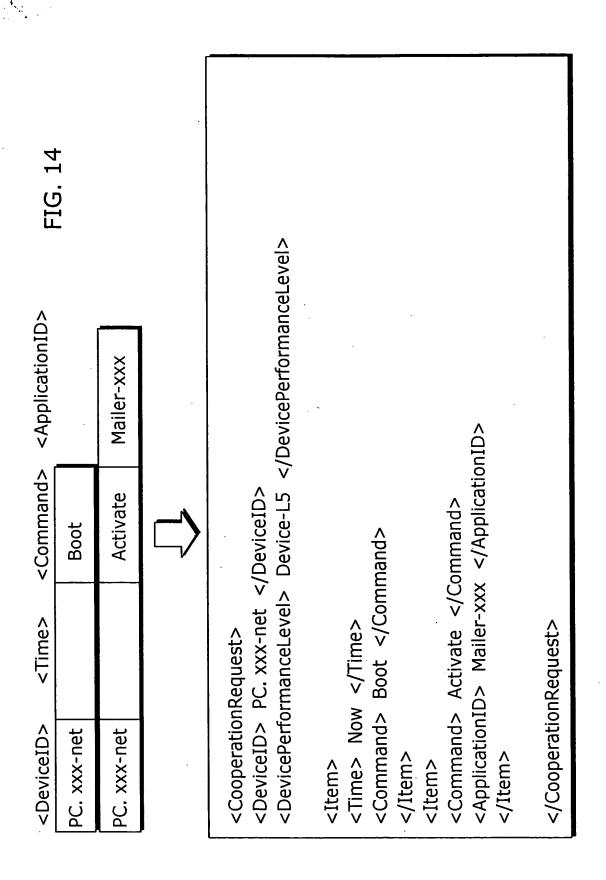


FIG. 15 start Step 2a Associated No operation logs from other devices exist? Yes Step 2b Calculate appearance frequency of each attribute value per device and per descriptor Step 2c Group operation logs depending on appearance frequency of attribute values Step 2d Present user with grouped operation logs Step 2e Operation No logs matching situation exist? Yes Step 2f Select operation logs Step 2g Select attribute values Step 2h Generate cooperating operation details Step 2i Transmit cooperating operation details end

				-	•								
FIG. 16	<applicationid></applicationid>	Null		Mailer-xxx:10			<applicationid></applicationid>	Null	Mailer-xxx:10	Browser-xxx:5	Editor-xxx:3	Img-viewer:2	
	<command/>	Boot:10		Activate:20	\Box	<command/>	Boot:10	Activate: 20				P	
	<time></time>	MoM	:	Now		<time></time>	Now	Now					
	Select logs <deviceid></deviceid>	PC. xxx-net		PC. xxx-net			Select logs <deviceid></deviceid>	PC. xxx-net	PC. xxx-net			·	
	Select log	0		0			Select log	•	•				

FIG. 17 start Step 3a Associated No operation logs from other devices exist? √ Yes Step 3b Calculate appearance frequency of each attribute value per device and per descriptor Step 3c Group operation logs depending on appearance frequency of attribute values Step 3d Present user with grouped operation logs Step 3e Operation No logs matching situation exist? Yes Step 3f Select operation logs Step 3g Select attribute values Step 3h Input attribute values Step 3i Generate cooperating operation details Step 3i Transmit cooperating operation details end

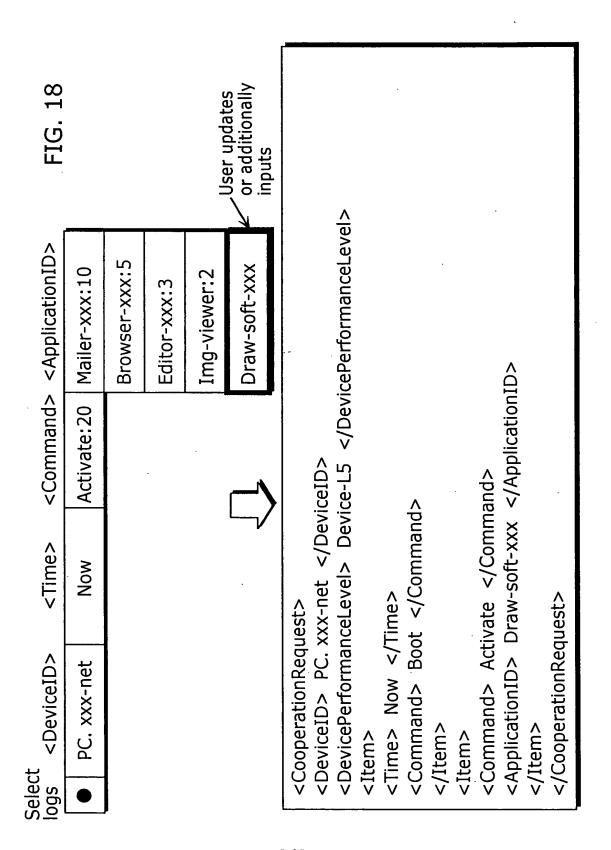
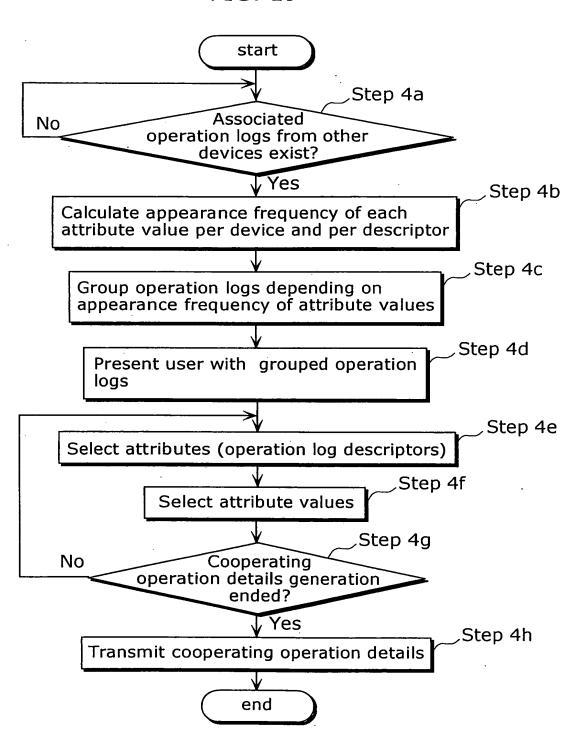
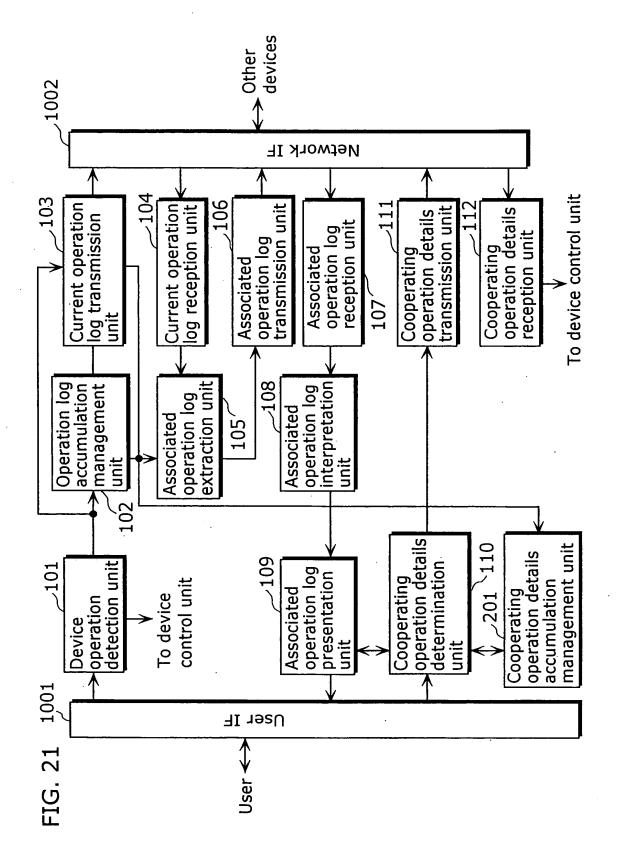


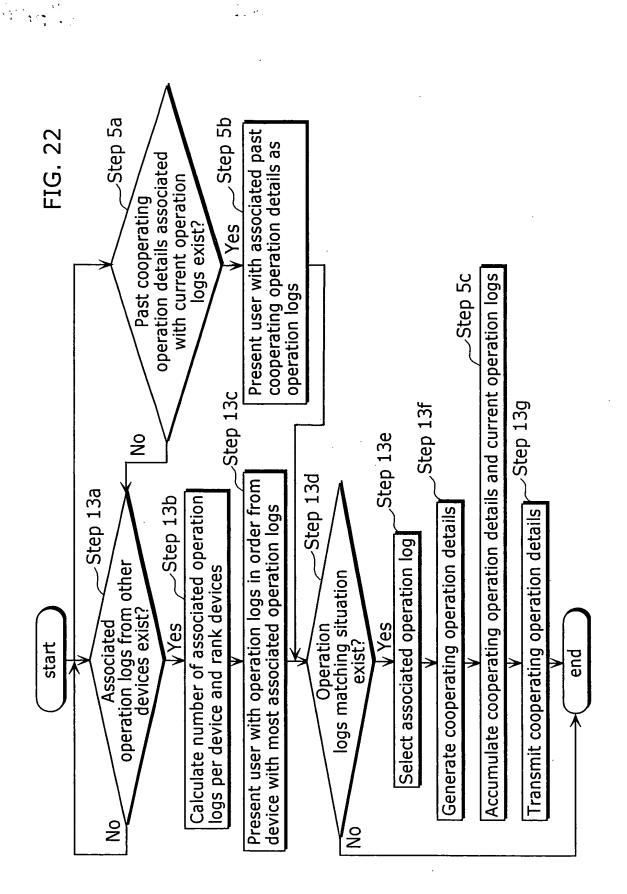
FIG. 19

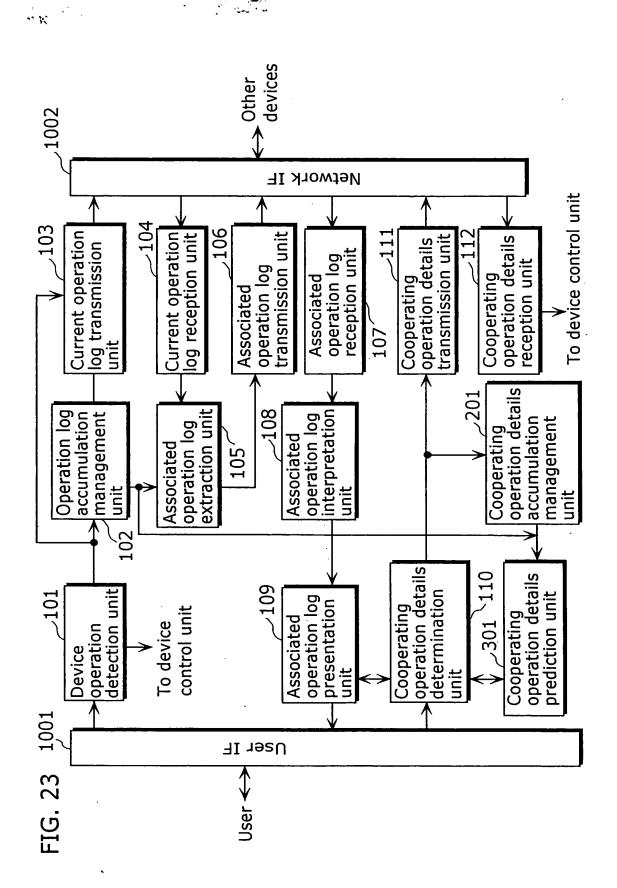


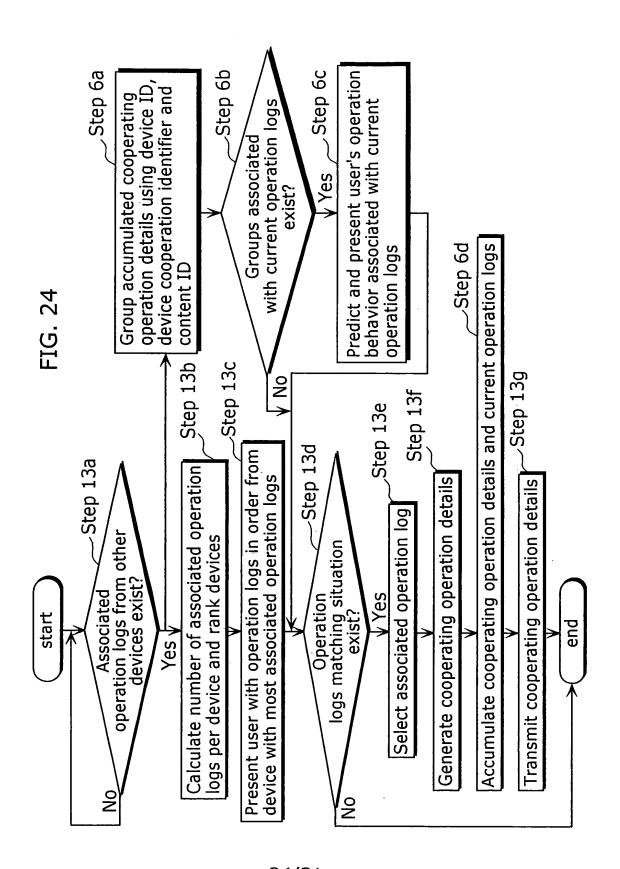
<DeviceFrom> <DeviceFrom> HDD. xxx-net HDD. xxx-net PC. xxx-net <ContentID> <ApplicationID> <PersonTo> <ContentID> B-xxx. mp2 A-xxx. mp2 <Cooperating operation details: after selection using pull-down menu> B-xxx. mp2 C-xxx. wav FIG. 20 tt. txt <Command> <ApplicationID> <PersonTo> ppp. co. jp ppp. co. jp <New cooperating operation details:initial state> Mailer-xxx:10 Mailer-xxx:10 PC. xxx-net | Activate: 20 | MovieEditor: 5 <Command> Activate: 20 Activate: 20 Rec Rec HDD. xxx-net <DeviceID> <DeviceID> MD. xxx-net PC. xxx-net PC. xxx-net











1.7.7.

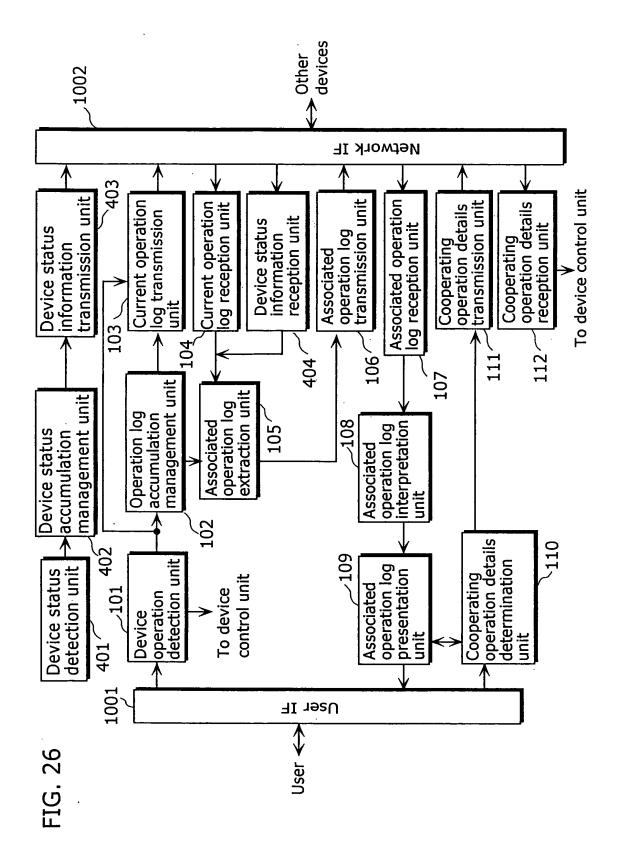
Device cooperation identifier FIG. 25 <DeviceFrom> HDD. xxx-net <ContentID> <ContentID> (a) Grouped accumulated cooperating operation details A-xxxxxx A-xxxxxx <Command> <Command> Copy Rec <Time> <Time> HDD. xxx-net <DeviceID> <DeviceId> PC. xxx-net

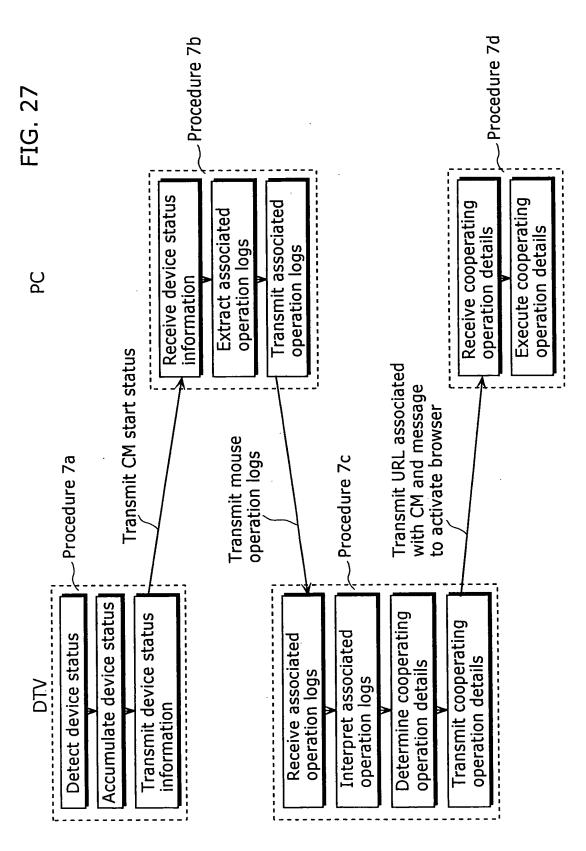
Strain S

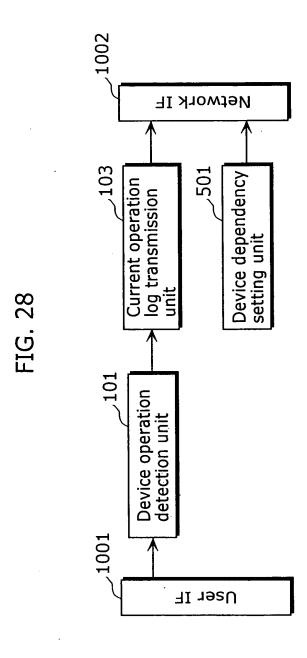
<ContentID> B-xxxxxx <Command> Rec (b) Current operation log <Time> HDD. xxx-net <DeviceID>

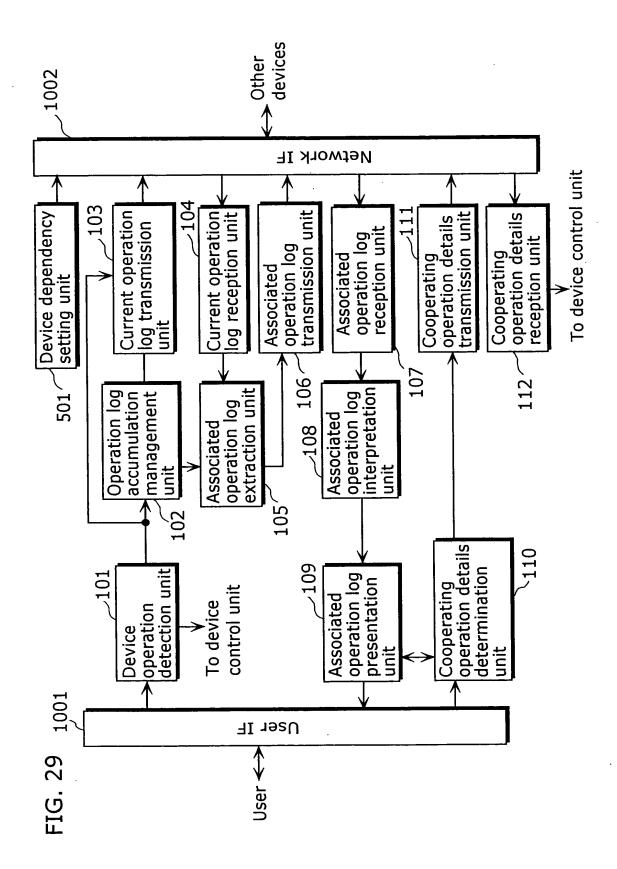
Predicted cooperating operation details presented to user (replacement of content ID) <ContentID> <DeviceFrom> <Command> <Time>

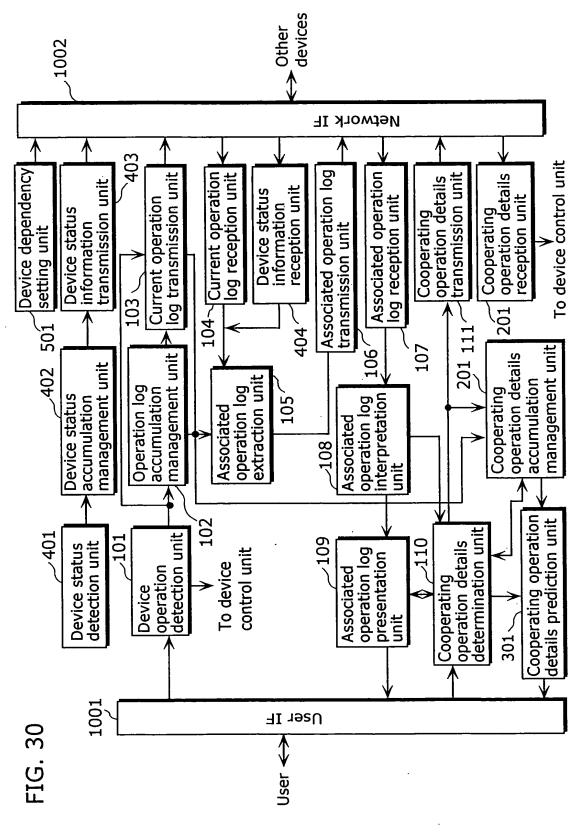
HDD. xxx-net B-xxxxxx Copy <DeviceID> PC. xxx-net

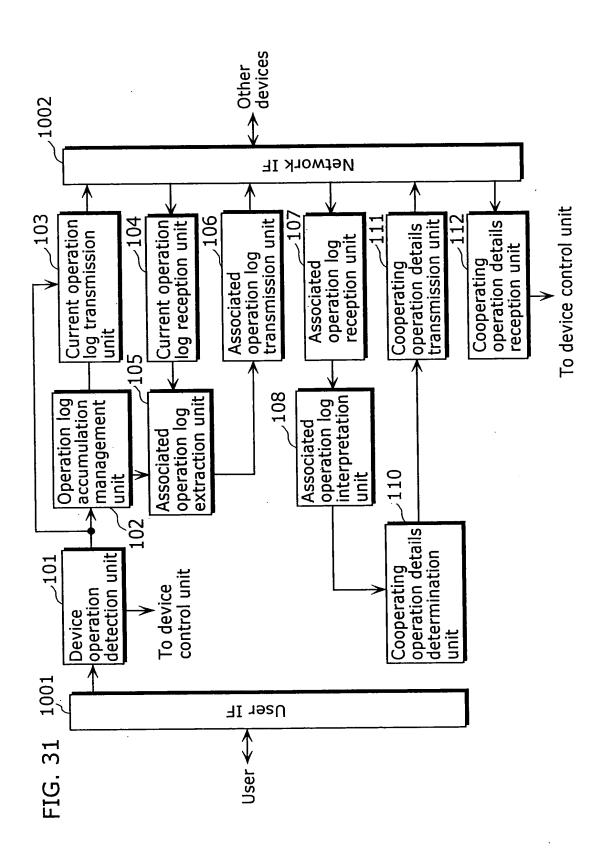












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